

## CLAIMS

What is claimed is:

1. A multi-layer user management method for multicasting proxy, comprising:

(1) dividing a user management for multicasting groups into three layers: management at an interface layer for controlling multicasting characteristics corresponding to interfaces, management at a data link layer for controlling multicasting characteristics corresponding to data links and management at user layer for controlling multicasting characteristics corresponding to particular users, and at each layer, setting control blocks that are respectively comprised of multicasting characteristic data corresponding to said each layer;

(2) establishing a data relationship among the three layers of control blocks; and

(3) managing users of the multicasting groups through the data relationship among the three layers of control blocks.

2. The method of Claim 1, wherein said controlling multicasting characteristics corresponding to interfaces includes: judging whether to allow multicasting applications at an interface, judging whether to allow multicasting applications at a user side or a network side, judging whether to allow tying multicasting resources or multicasting groups, limiting the number of members of a multicasting group or limiting the number of multicasting groups.

3. The method of Claim 1, wherein said controlling multicasting characteristics corresponding to data links is limiting the number of members of a multicasting group when employing a core edge layer network device such as an Edge Service Router (ESR).

4. The method of Claim 1, wherein said controlling multicasting characteristics corresponding to data links is forwarding only one multicasting packet for all members of the same multicasting group at the same data link when forwarding data.

5. The method of Claim 1, wherein the data relationship is established through a linking-list structure or a relational database structure.

6. The method of Claim 1, wherein the data relationship is established through a three-dimensional linking-list data structure which links each control block with linking-lists or arrays; the three dimensions of the three-dimensional linking-list data structure comprise data link including interface, multicasting group and user IP.

7. The method of Claim 1, wherein managing the users of the multicasting groups is managing the user's joining or leaving a multicasting group, further comprising:

finding a certain interface layer control block according to data structure of an interface of net (IFNET) having received a multicasting packet; then judging multicasting characteristics of the multicasting group which are defined in the found interface layer control block to determine whether to continue the successive processing; if so, performing the next steps, otherwise ending the processing;

finding a certain data link layer control block according to the data relationship between data link layer control blocks and said interface layer control block; then judging multicasting characteristics corresponding to data links of the multicasting packet to determine whether to continue the successive processing; if so, performing the next step, otherwise ending the processing; and

finding a certain user layer control block according to a multicasting group IP and user attributes; then adding, deleting or modifying corresponding user information in the user layer control block.

8. The method of Claim 7, further comprising:

if no proper data link control block is found when finding a certain data link control block, adding a new data link layer control block at the data link; and

establishing the data relationship among interface layer control blocks, user layer control blocks and the new data link layer control block.

9. The method of Claim 1, wherein managing the users of the multicasting groups is forwarding control, further comprising:

making data link layer devices attend multicasting management with device cluster control technique.

10. The method of Claim 1, wherein managing the users of the multicasting groups is flow charging control, further comprising:

recording the flow of multicasting packets having been forwarded with a device forwarding program and charging the user who has received said multicasting packets.